

Todorov et al. Application No. 09/954,508

Reply to Office Action

REMARKS

The Office Action dated January 13, 2005, and the references cited therein have been considered. Claims 1-50 are presently pending. No claims currently stand allowed. Applicants request favorable reconsideration of the previous rejection in view of the following remarks. Please charge any fee deficiencies to Deposit Account No. 12-1216.

Summary of the Rejections in View of the Prior Art

Claims 1-8, 22, 30-31 are rejected as anticipated under 35 U.S.C. Section 102(e) in view of Tang U.S. Published Application 2001/0025321 (Tang).

Claim 44 is rejected as anticipated under 35 U.S.C. Section 102(e) in view of Dean U.S. Patent No. 5,991,820 (Dean).

Claims 9-21, 23-29, and 32-43 are rejected as obvious under 35 U.S.C. Section 103(a) over Tang in view of Dean.

Claims 45-50 are rejected as obvious under 35 U.S.C. Section 103(a) over Dean in view of Tang.

Applicants traverse the grounds for each and every rejection of pending claims 1-50 for at least the reasons set forth herein below.

Before addressing the specific grounds for the rejection, Applicants respectfully submit that the Tang reference, which is relied upon for the rejection of all the claims except claim 44, does not even constitute prior art. The Office Action has relied upon the *published* Tang application that was filed on February 14, 2001. The presently pending application claims priority to the Todorov et al. provisional application filed on September 15, 2000.

In general, the cited Tang reference not only does not meet all the elements of the recited invention, they do not even fall within the relevant field of the claimed invention. For at least this reason, Applicants traverse all rejections of the pending claims that are based upon the Tang reference. Applicants address the specific rejections in the order they arise in the Office Action.

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Summary of Applicants' Claimed Invention

Applicants' claimed invention is generally directed to a particular class of server used in an industrial process control environment that is referred to as a "data access server." Applicants unambiguously explain in the "Field of the Invention" section of the present application that "[T]he present invention generally relates to the field of computerized process control networks. More particularly, the present invention relates to data access server systems providing access by supervisory level client applications to process control information."

The claims are generally directed to the functional capabilities/architecture of a data access server that supports receiving data access requests submitted by clients of the server according to potentially multiple differing data exchange protocols. The client requests seek process data stored at various locations in a process control system. The ability to respond to requests submitted according to multiple differing data exchange protocols is facilitated by an abstraction layer, comprising a set of operations, callable by each of the data exchange protocol-specific modules that are incorporated into the data access server.

The present invention offers a new degree of extensibility to client application interfaces in a process control system. Enhanced extensibility/flexibility is achieved in a data access server by decoupling data access server engine functionality (carried out by a set of operations provided in an interface) from the client data exchange protocols used by client applications to access process data via the data access server. The present invention achieves such decoupling by carrying out specific data exchange protocols in a set of user installable/selectable/replaceable program modules. These program modules are installed on the data access server to facilitate retrieval/presentation of data to the client applications according to a variety of protocols (e.g., DDE, OPC, SuiteLink, etc.) utilized by the client applications. After installation, the program modules provide a protocol-specific interface to client applications and communicate with the data access server engine via a standardized universal set of operations/interfaces. Extending the functionality of the data access server to support additional data exchange protocols is accomplished by providing and installing a new data exchange protocol module on the data access server. Previously existing software on the data access server, including the data access

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server engine and the previously installed protocol-specific protocol modules, need not be modified to include the new data exchange protocol module in the data access server system.

Summary of the Teachings of the Cited Prior Art References

The published Tang application discloses a multiplexing router that implements a specific method for passing a set of multiplexed packets to another (de-multiplexing) router in a network. In stark contrast to the subject-matter of the claimed invention, nowhere does the Tang application even remotely disclose or suggest a data access server for responding to client requests seeking process control system information. Instead, Tang discloses a multiplexing router that, as explained in paragraph 0021, substitutes an "address label" for a specified internetwork layer address and transport layer address combination. The address label and corresponding internetwork and transport layer address combination are stored in a connection table maintained by all multiplexing routing nodes. The connection tables are used by the multiplexing routers to route messages containing the modified addresses to their destinations. Substituting the address label for protocol-specific network addresses allows the routing nodes to route packets of information independent of their specified internetwork and transport layer address protocols.

The disclosed system comprises a base transceiver station 102 coupled to an access node 104. The Access node 104 is connected to a set of data processing devices (106, 107, 108 and 110) via a radio network router client (RRC) 105. Nowhere does the Tang application disclose the recited invention directed to a process data access server.

The Dean patent discloses a method for starting up applications that comprise multiple processes. In particular, Dean discloses separating an application into time critical and non-critical processes. The time critical processes operate directly with an operating system. The non-critical processes operate through a window system interface. Applicants respectfully submit that the Dean patent neither discloses nor even remotely suggests the claimed invention that concerns a data access server and its creation/startup (as recited in claim 44).

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Applicants Remarks Concerning the Specific Grounds for the Rejection

Applicants traverse the rejection of claim 1 as being anticipated by the Tang patent application. As an initial matter, the Tang application neither discloses nor even remotely suggests a "data access server." Applicants, in the original specification (see paragraphs 6 and 7 of the published Hessmer et al. application reproduced herein below), describe a data access server for manufacturing processes.

[0006] Data access servers facilitate placing process control data within reach of a variety of higher-level monitoring/control client applications. During the course of operation, process controllers generate status and control information concerning associated processes. The controllers' process status and control information is stored within process control databases and/or distributed to a number of locations within the process control network. Other process information is generated/stored within field devices (e.g., intelligent transmitters) having digital data communication capabilities. The process information is retrieved from the databases and field devices by data servers for further processing/use by the process control system. For example, the data access servers provide the retrieved information to a variety of client applications providing high-level control and monitoring (both human and computerized) services.

[0007] Proper operation of the high-level control and monitoring applications relies upon proper data interfaces between the process control/field device levels of a process control system and the higher-level supervisory/monitoring levels. The raw data at the control/field device levels of a process control system is stored in a variety of formats depending upon standards incorporated into the process control systems. Likewise, the client applications associated with, for example, the supervisory and monitoring level of a process control system potentially receive data from the data access servers according to any one (or more) of multiple existing (and future) application data interface protocols.

As demonstrated by the above quotation, Applicants have provided a clear description of a data access server. Applicants respectfully submit that the Tang application, directed to a *router* with enhanced address protocol handling capabilities, does not even remotely describe/suggest the functionality of a process data access server.

Applicants traverse the Office Action's assertion that Tang's application server 107 constitutes the recited data access server. The claimed data access server responds to client requests for data in a process control system. However, the described functionality of the application server 107 (at paragraph 33) is merely that it can be a "data receiving/transmitting

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device". Tang neither discloses nor suggests that the application server 107 incorporates the functionality of the claimed process data access server.

If the application server 107 is indeed the "process data access server", then it must include each of the recited elements of claim 1. However, the Office Action's citations to Tang clearly reference components that do not exist within the application server 107. For example, the Office Action references the disclosure of Tang's paragraph 15 as corresponding to the claimed "device protocol interface" (see, Applicants' device protocol component 96) However, the application server 107 is not mentioned anywhere in paragraph 15 of Tang.

Applicants traverse the Office Action's assertion that Tang's radio network router client 105 constitutes the recited "client applications". First, the RRC 105 is a single entity that carries out routing and mapping functions for data packets. Tang neither discloses nor suggests that the RRC 105 comprises multiple client applications (that submit requests to the data access server). In the event that the rejection is not withdrawn, Applicants request an explanation regarding how the single RRC 105 corresponds to the recited "client applications" of claim 1.

Applicants traverse the Office Action's assertion that Tang's paragraph 15 discloses the recited "device protocol interface." Paragraph 15 describes router functionality for passing data. Nowhere does paragraph 15 disclose or suggest an interface for "accessing process data storage locations in a process control system."

Applicants traverse the Office Action's assertion that the end units 106 and 108 correspond to the recited set of client data exchange protocol modules. As an initial matter, the end units are independent components that do not reside within the application server 107. The function performed by the recited data exchange protocol modules is to receive requests from client applications according to particular client data exchange protocols (e.g., DDE, OPC). Nowhere is such functionality attributed to the end units 106 and 108. The end units 106 and 108 exchange data packets with the access node 104. The Tang reference neither discloses nor suggests that the end units 106 and 108 receive requests for access to process data storage locations according to particular client data exchange protocols. In the event that the rejection is not withdrawn Applicants request identification of such process data storage access requests in the Tang application.

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Applicants traverse the Office Action's assertion that the application server 107 corresponds to the recited data access server engine. As mentioned previously above the application server 107 is merely described as a source/recipient of data packets. Claim 1 recites the data access server engine receives process data access requests via the client data exchange protocol modules. The Office Action previously asserted that the end units 106 and 108 correspond to the recited client data exchange protocol modules. However, in contrast to the recited invention, nowhere does Tang state that the end units 106 and 108 submit such requests to the application server 107.

Furthermore, with regard to the Office Action's assertion that the application server 107 corresponds to the recited data access server engine, Applicants have carefully reviewed paragraphs 13-15 of Tang and cannot discern any teachings that describe or suggest the presence, within the application server 107, of Applicants' recited "client application data exchange protocol abstraction layer comprising a set of operations callable by ones of the set of client data exchange protocol modules...." In the event that the rejection of claim 1 is not withdrawn, Applicants' request identification of this element in Tang.

Applicants traverse the rejection of claims 2-5 and 30 for at least the reasons set forth herein above with regard to claim 1. Furthermore, the Office Action previously asserted that the protocol modules correspond to end units 106 and 108. However, the end units 106 and 108 are physically separate and distinct hardware from other components identified in FIG. 2 of Tang. In contrast, the recited protocol modules are software entities (plugins) executing on a computer system containing the process data access server. For at least this additional reason claims 2-5 and 30 are not anticipated by Tang.

Applicants traverse the rejection of claims 6 and 31 for at least the reasons set forth herein above. Furthermore, the Office Action references lines from paragraph 14 of Tang that do not disclose the protocol module arrangement recited in claims 6 and 31.

In addition to the grounds recited above for claim 1, Applicants traverse the rejection of dependent claim 7 for at least the additional reason that the Office Action previously identified

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the *application server 107* as corresponding to the recited data access server engine. Yet in this rejection the access node 104, a separate and distinct node from the application server 107, is now identified as the data access server engine. Furthermore, Applicants respectfully submit that nowhere in FIG. 1 and paragraph 14 is the recited loading mechanism described. No startup process is described.

Applicants traverse the rejection of claim 8 for the above reasons described with regard to claim 1. Furthermore, claim 8 recites an important aspect of the data access server engine – the ability of multiple, differing types of data exchange protocol modules to access a same callable operation on the server engine. Applicant has reviewed paragraph 14, and nowhere is there any mention whatsoever of the application server 107 (the alleged engine) having the recited callable operation.

Applicants traverse the rejection of claim 22. As mentioned previously herein above, Tang neither discloses nor even remotely suggests a process data access server. Applicants furthermore incorporate by reference the arguments presented in the traversal of claim 1. The recited method incorporates steps for converting data exchange protocol-specific requests received by the process data access server, into requests supported by a module-engine interface specification. Thereafter, the engine executes the converted request. The Office Action identifies the flowchart depicted in FIG. 7 as corresponding to the recited claim steps. However, there is no disclosure of the specifically recited request conversion step anywhere in the disclosure of the Tang application. Importantly, the Office Action only provides cursory references to the disclosure of the Tang reference. In the event that the rejection of claim 22 is not withdrawn, Applicants specifically request identification of teachings in the Tang reference corresponding to each element of the recited method steps (including references to components that execute the steps where appropriate).

Applicants traverse the rejection of claim 44 as being anticipated by Dean. As explained above, Dean merely discloses a two-path interface scheme between processes of an application and the operating system of a computer upon which the application executes. Applicants have

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defined a "data access server" in the specification. Nowhere is the recited "data access server" even remotely disclosed or suggested in the Dean reference. The Office Action references a Window System server 250 as corresponding to the data access server recited in claim 44. However, a careful reading of the Dean patent reveals that the server 250 has none of the operational/functional capabilities of the recited data access server. As explained at col. 5, lines 35 et. seq. the window server 250 "controls the display and the priority of access of the application programs to the display." In the event the rejection is not withdrawn, applicants request identification of teachings in the Tang reference corresponding to each element of the recited method steps (including references to components that execute the steps where appropriate).

Turning to the obviousness rejections, Applicants traverse the rejection of claims 9-21, 23-29, and 32-43 as being obvious over Tang in view of Dean. As an initial matter, the Tang reference is directed to a *router* – not a process data access server. There is no basis for modifying Tang's router architecture to render a data access server that responds to client requests for access to process control information. In addition to the reasons set forth herein above with regard to independent claims 1 and 22, applicants traverse each of the obviousness rejections for the reasons set forth below.

Applicants traverse the rejection of claim 9. The cited reference neither discloses nor suggests an arrangement wherein the client data exchange module and data access server comprise independently designated files. In the event the rejection is not withdrawn, Applicants request specific identification of the portions of the cited references wherein the recited start-up process is carried out through independently designatable protocol module and data access server files. As noted above, neither Dean nor Tang disclose a process data access server, and therefore the recited elements of claim 9 cannot be disclosed by the recited prior art teachings.

Applicants traverse the rejection of claims 10-11 and 32-34. The cited prior art neither discloses nor suggests the recited invention involving receiving and executing, by a process data access server engine, operations corresponding to data access requests received by the data

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access server engine via the protocol modules. Applicants cannot discern any relevance of the cited references to these presently rejected claims. In the event that the rejection is not withdrawn, Applicants request specific identification of each element in these dependent claims.

Applicants traverse the rejection of claim 12 that merely recites the claimed element without any form of citation to the prior art. Applicants acknowledge that filtering out unchanged information is a known data compression technique. However, Applicants know of no teachings in the prior art disclosing incorporating such functionality into the invention recited in claim 11.

Applicants traverse the rejection of claims 13-21 and 35-43. The rejected claims recite specific operations that are known generally in the data access server art. However, none have been incorporated into an interface supported by the recited data access server engine and callable by a variety of protocol-specific modules as recited in claims 1 and 22. None of these operations are disclosed in either Tang or Dean.

Applicants traverse the rejection of claims 23-29. Clearly neither Tang nor Dean even remotely disclose a process data access server. In fact Tang does not even operate as a server. It is a router. The Office Action has not demonstrated how the recited elements concerning the execution of operations, supported by the engine and called by the protocol-specific modules, could be disclosed or even remotely suggested by either of the cited references since neither of the cited references concerns a data access server. In the event the rejection is not withdrawn, Applicants request specific identification of the teachings in the prior art corresponding to each recited element.

Applicants traverse the rejection of claims 45-50 as obvious over Dean in view of Tang. Applicants have reviewed the grounds for the rejection and cannot discern any basis for modifying Dean in view of Tang to render any of the recited elements. In each instance the Office Action concedes that the recited element is not present in either reference, yet concludes that the inventions are obvious in view of the prior art. In the event the rejection is not

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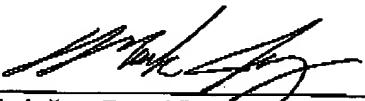
withdrawn, Applicants request identification of specific teachings in the prior art supporting these bare assertions regarding the obviousness of the recited inventions.

In summary, the present invention is distinguishable from the cited references for a variety of reasons. Most importantly, the invention recited in the presently pending claims is directed to a process data access server. However, neither Tang (a router) nor Dean (operating system interface) discloses or even remotely suggests a data access server. For at least the reasons set forth herein, each of the presently pending claims is patentable over the prior art.

Conclusion

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



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